

Chapter 13

Configuring Channelized E1 Interfaces

Each Channelized E1 PIC and Channelized E1 Intelligent Queuing (IQ) PIC has 10 E1 ports that you can channelize to the *NxDS0* level. Each E1 interface has 32 time slots (DS0), in which time slot 0 is reserved. You can combine one or more of these DS0 time slots (channels) to create a channel group (*NxDS0*).

This chapter is organized as follows:

Configuring Channelized E1 IQ Interfaces on page 257

Configuring Channelized E1 Interfaces on page 259

For examples of channelized E1 interface configuration, see the following sections:

Example: Configuring Channelized E1 IQ Interfaces on page 262

Example: Configuring Channelized E1 Interfaces on page 263

Configuring Channelized E1 IQ Interfaces

This section describes how to configure channelized E1 IQ interfaces, discussing the following topics:

Configuring E1 IQ Interfaces on page 257

Configuring Fractional E1 IQ Interfaces on page 258

Configuring *NxDS0* IQ Interfaces on page 259

Configuring E1 IQ Interfaces

To configure an E1 interface, include the `no-partition` and `interface-type` statements at the `[edit interfaces ce1-fpc/pic/port]` hierarchy level:

```
[edit interfaces ce1-fpc/pic/port]
no-partition interface-type e1;
```

This configuration creates interface `e1-fpc/pic/port`.

Configuring Fractional E1 IQ Interfaces

By default, all the time slots on a channelized E1 interface are used. To configure a fractional E1 interface on a Channelized E1 IQ PIC, you must perform the following tasks:

1. Include the no-partition statement at the [edit interfaces ce1-fpc/pic/port] hierarchy level:

```
[edit interfaces ce1-fpc/pic/port]
no-partition;
```

This configuration creates interface e1-fpc/pic/port.

2. Configure the number of time slots allocated to the E1 IQ interface by including the timeslots statement at the [edit interfaces e1-fpc/pic/port e1-options] hierarchy level:

```
[edit interfaces e1-fpc/pic/port e1-options]
timeslots time-slot-range;
```

NxDS0 timeslots configured on either a channelized STM1 IQ interface or channelized E1 IQ interface are numbered from 1 to 31 (0 is reserved), while fractional E1 timeslots range from 2 to 32 (1 is reserved).

To configure ranges, use hyphens. To configure discontinuous time slots, use commas. Do not include spaces.

For more information about E1 time slots, see “Configuring Fractional E1 Time Slots” on page 326.

Example: Configuring Fractional E1 IQ Interfaces

Configure a fractional E1 interface that uses time slots 2 through 10:

```
[edit interfaces ce1-0/0/0]
no-partition;

[edit interfaces e1-0/0/0 e1-options]
timeslots 2-10;
```

For a full configuration example, see the *JUNOS Feature Guide*.

Configuring NxDS0 IQ Interfaces

By default, all the time slots on a channelized E1 interface are used. To configure an NxDS0 IQ interface on a Channelized E1 IQ PIC, you must configure the number of time slots allocated to the NxDS0 IQ interface by including the `partition`, `timeslots`, and `interface-type` statements at the `[edit interfaces ce1-fpc/pic/port]` hierarchy level, specifying the ds interface type:

```
[edit interfaces ce1-fpc/pic/port]
partition partition-number timeslots time-slot-range interface-type ds;
```

For channelized E1 IQ interfaces, the partition number range is from 1 through 31.

For E1 IQ interfaces (`e1-fpc/pic/port`), the time-slot range is from 2 through 31. For channelized E1 IQ interfaces (`ce1-fpc/pic/port`), the time-slot range is from 1 through 31. You can designate any combination of time slots. To configure ranges, use hyphens. To configure discontinuous time slots, use commas. Do not include spaces. For more information about E1 time slots, see “Configuring Fractional E1 Time Slots” on page 326.

Example: Configuring an NxDS0 IQ Interface

Configure an NxDS0 interface that uses time slots 2 through 10. This configuration creates the `ds-0/0/0:1:1` interface.

```
[edit interfaces ce1-0/0/0:1]
partition 1 timeslots 2-10 interface-type ds;
```

For a full configuration example, see the *JUNOS Feature Guide*.

Configuring Channelized E1 Interfaces

By default, all the time slots on a channelized E1 interface are used. There can be a maximum of 24 channel groups per channelized E1 interface. Thus, you can configure a maximum of 240 channel groups per PIC.

To specify the DS0 channel group number in the interface name, include a colon (:) as a separator. For example, a Channelized E1 PIC might have the following physical and virtual interfaces:

```
ds-0/0/0:x
```

`x` is a DS0 channel group ranging from 0 through 23 (for more information about ranges, see Table 25 on page 260).

You can use any of the values within the range available for *x*; you do not have to configure the links sequentially. In addition, the JUNOS software applies the interface options you configure according to the following rules:

To configure the `e1-options` statement, you must set channel group *x* to 0:

```
ds-0/0/0:0
```

There are no restrictions on configuring the `ds0-options` statement.

If you delete a configuration you previously committed for channel group 0, the options return to default values.

To configure the channel groups and time slots for a channelized E1 interface, include the following statements at the `[edit chassis]` hierarchy level:

```
[edit chassis]
fpc slot-number {
  pic pic-number {
    ce1 {
      e1 link-number {
        channel-group group-number;
        timeslots time-slot-range;
      }
    }
  }
}
```



NOTE: If you commit the interface name but do not include the `[edit chassis]` configuration, the Channelized E1 PIC behaves like a standard E1 PIC: None of the DS0 functionality is accessible.

There are 32 time slots on an E1 interface; however, time slot 0 is reserved. You can designate any combination of time slots. To configure ranges, use hyphens. To configure discontinuous time slots, use commas. Do not include spaces.

Table 25 shows the ranges you can specify.

Table 25: Ranges for Channelized E1 Configuration

Item	Option	Range
FPC slot	<i>slot-number</i>	0 through 7
PIC slot	<i>pic-number</i>	0 through 3
E1 link	<i>link-number</i>	0 through 9
DS0 channel group	<i>group-number</i>	0 through 23
Time slot	<i>time-slot-range</i>	0 through 31 (with time slot 0 reserved)

The theoretical maximum number of channel groups possible per PIC is $10 * 24 = 240$. This is within the maximum bandwidth available.



NOTE: NxDS0 timeslots configured on either a channelized STM1 IQ interface or channelized E1 IQ interface are numbered from 1 to 31 (0 is reserved), while fractional E1 timeslots range from 2 to 32 (1 is reserved).

FPC slot range depends on platform. For the TX Matrix platform, the range is from 0 through 31. For M40, M40e, M160, M320, and other T-series routing platforms, the range is from 0 through 7. For M20 routing platforms, the range is from 0 through 3. For M10 and M10i routing platforms the range is from 0 through 1. For M5 and M7i routing platforms, the only applicable value is 0.

Configuring Channelized E1 Interface Properties

To configure channelized E1 interface properties, include the e1-options statement at the [edit interfaces *interface-name*] hierarchy level:

```
[edit interfaces interface-name]
e1-options {
  fcs (32 | 16);
  framing (g704 | g704-no-crc4 | unframed);
  idle-cycle-flag (flags | ones);
  loopback (local | remote);
  start-end-flag (shared | filler);
}
```

To specify options for each of the DS0 channels, include the ds0-options statement at the [edit interfaces *interface-name*] hierarchy level:

```
[edit interfaces interface-name]
ds0-options {
  byte-encoding (nx64 | nx56);
  fcs (32 | 16);
  idle-cycle-flag (flags | ones);
  loopback payload;
  start-end-flag (shared | filler);
}
```

For DS0 channels on a channelized E1 interface, the clocking statement is supported only for channel 0; it is ignored if included in the configuration of channels 1 through 11. The clock source configured for channel 0 applies to all channels on the channelized E1 interface. The individual DS0 channels use a gapped 45-MHz clock as the transmit clock. When you configure the clock source for a channelized interface—ds-x/y/z:0, for example—you must also include the channel-group statement at the [edit chassis] hierarchy level, and specify channel group 0. For more information, see “Clock Sources on Channelized Interfaces” on page 250.

Only a subset of the E1 options is valid for the channelized configuration; you specify the time slots using the [edit chassis] configuration described in “Examples: Interface Naming” on page 36. For more information about the E1 and DS0 options, see “Configuring E1 Interfaces” on page 321 and “Configuring T1 Interfaces” on page 545.

Each E1 interface has 32 time slots (DS0s), in which time slot 0 is reserved. You can combine one or more of these DS0 time slots (channels) to create a channel group (NxDs0). There can be a maximum of 24 channel groups per E1 interface.

Example: Configuring Channelized E1 IQ Interfaces

Configuring an E1 Interface Configure a channelized E1 interface as an unpartitioned, clear channel.

```
[edit interfaces]
ce1-2/0/0 {
  no-partition interface-type e1; # e1-2/0/0
}
```

Configuring Multiple Interface Types The following configuration is sufficient to get the channelized E1 IQ interface up and running:

```
[edit]
interfaces {
  ce1-1/2/3 {
    partition 1 timeslots 10 interface-type ds; # ds-1/2/3:1
    partition 2 timeslots 1-9 interface-type ds; # ds-1/2/3:2
  }
  ds-1/2/3:1 {
    unit 0 {
      family inet {
        address 10.25.1.2/24;
      }
    }
  }
  ds-1/2/3:2 {
    unit 0 {
      family inet {
        address 10.25.2.2/24;
      }
    }
  }
}
```

```
[edit]
interfaces {
  ce1-1/2/6 {
    no-partition interface-type e1; # e1-1/2/6
  }
  e1-1/2/6 {
    e1-options {
      timeslots 1-2;
    }
    unit 0 {
      family inet {
        address 10.255.126.2/24;
      }
    }
  }
}
```

Example: Configuring Channelized E1 Interfaces

The following configuration is sufficient to get the channelized E1 interface up and running:

```
[edit chassis]
fpc 0 {
  pic 1 {
    ce1 {
      e1 0 {
        channel-group 0 timeslots 1;
        channel-group 1 timeslots 2;
        channel-group 5 timeslots 5-7;
      }
      e1 4 {
        channel-group 10 timeslots 11,17,28-31;
      }
    }
  }
}

[edit interfaces ds-0/1/0:0]
e1-options {
  fcs 32;
  framing g704-non-grc;
  loopback remote;
}

[edit interfaces ds-0/1/4:10]
ds0-options {
  byte-encoding nx56;
  start-end-flag filler;
}
```

Configuring the Following Interfaces

ds-0/1/0:1, with time slot 1 allocated
 ds-0/1/0:5, with time slots 5 through 7 allocated
 ds-0/1/4:10, with time slots 11, 17, and 28 through 31 allocated

The remaining ports (other than 0 and 4) remain as regular E1 interfaces (and follow the e1-0/1/x naming convention).

```
[edit chassis]
fpc 0 {
  pic 1 {
    ce1 {
      e1 0 {
        channel-group 1 timeslots 1;
        channel-group 5 timeslots 5-7;
      }
      e1 4 {
        channel-group 10 timeslots 11,17, 28-31;
      }
    }
  }
}
```

Use Time Slots 1 Through 10

```
[edit chassis fpc slot-number pic pic-number ce1 e1 link-number]
channel-group group-number;
timeslots 1-10;
```

Use Time Slots 1 Through 5, 10, and 24

```
[edit chassis fpc slot-number pic pic-number ce1 e1 link-number]
channel-group group-number;
timeslots 1-5,10,24;
```